

What is claimed is:

1. A carrying device for carrying an object to be processed above a base, said carrying device comprising:

(a) a pick for holding the object;

(b) a main arm mechanism having a proximal end supported by the base and a distal end connected to the pick, and adapted to bend and stretch in a first operating plane; and

(c) an auxiliary arm mechanism including:

(c1) a base arm having a proximal end supported by the base, and a distal end, and

(c2) an arm linkage having a proximal end connected to the distal end of the main arm and a distal end connected to the pick, and adapted to bend and stretch in a second operating plane intersecting the first operating plane.

2. The carrying device according to claim 1, further comprising first and second drive shafts coaxially supported by the base for individual rotation, and

the proximal end of the main arm mechanism and the proximal end of the base arm are connected to the first and second drive shafts, respectively.

3. The carrying device according to claim 1, wherein the first operating plane in which the main arm mechanism operates is a horizontal plane, and the second operating plane in which the auxiliary arm mechanism operates is a vertical plane.

4. The carrying device according to claim 3, wherein a joint between the base arm and the arm linkage of the auxiliary arm mechanism is at a level lower than that of a joint between the arm linkage and the pick.

5. The carrying device according to claim 3, wherein the arm linkage of the auxiliary arm mechanism is bendable in a V-shape in the vertical plane.

6. A carrying device for carrying an object to be processed above a base, said carrying device comprising:

(a) first and second picks each for holding the object;

(b) a main arm mechanism adapted to bend and stretch in a first operating plane, and including:

(b1) a main arm having a proximal end supported by the base and a distal end,

(b2) a first arm having a proximal end connected to the distal end of the main arm and a distal end connected to the first pick, and

(b3) a second arm having a proximal end connected to the distal end of the main arm and a distal end connected to the second pick; and

(c) an auxiliary arm mechanism including:

(c1) a base arm having a proximal part supported by the base and first and second distal ends,

(c2) a first arm linkage having a proximal end connected to the first distal end of the base arm and a distal end connected to the first pick, and adapted to bend and stretch in a second operating plane intersecting the first operating plane, and

(c3) a second arm linkage having a proximal end connected to the second distal end of the base arm and a distal end connected to the second pick, and adapted to bend and stretch in a third operating plane intersecting the first operating plane.

7. The carrying device according to claim 6, wherein the base arm is configured to form a straight angle between a first extending direction from the proximal part toward the first distal end of the base arm, and a second extending direction from the proximal part toward the second distal end of the base arm, and

the first and second picks are moved in parallel to the first and second extending directions, respectively.

8. The carrying device according to claim 6, wherein the main arm has a first distal end connected to the proximal end of the first arm and a second distal end connected to the proximal end of the second arm, the first and second distal ends being spaced from each other,

the base arm is configured to form an angle below 180° between a first extending direction from the proximal part toward the first distal end of the base arm, and a second extending direction from the proximal part toward the second distal end of the base arm, and

the first and second picks are moved in parallel to the first and second extending directions, respectively.

9. The carrying device according to claim 6, wherein the first operating plane in which the main arm mechanism operates is a horizontal plane, and the second and third operating planes in which the auxiliary arm mechanism operates are vertical planes.

10. A carrying device for carrying an object to be processed above a base, said carrying device comprising;

(a) a pick for holding the object;

(b) a main arm mechanism adapted to bend and stretch in a first operating plane, and including:

(b1) a proximal main arm having a proximal end supported by the base, and a distal end,

(b2) a distal main arm having a proximal end and a distal end connected to the pick, and

(b3) one or more intermediate main arms each having a proximal end and a distal end connected to the distal end and the proximal end of the adjacent main arms, respectively; and

(c) an auxiliary arm mechanism adapted to bend and stretch in a second operating plane intersecting the first operating plane, and including:

(c1) an proximal auxiliary arm having a proximal end supported by the base, and a distal end,

(c2) an distal auxiliary arm having a proximal end and a distal end connected to the pick, and

(c3) intermediate auxiliary arms twice as many as the intermediate main arms, each having a distal end and a proximal end, one of the distal and proximal ends being connected to the end of the adjacent auxiliary arm, and the

other one of the proximal and distal ends being connected to the end of the adjacent auxiliary arm and supported for rotation by the intermediate main arm.

11. The carrying device according to claim 10, further comprising one or more connecting members through which the adjacent intermediate auxiliary arms are connected to each other, the connecting members being attached to the respective intermediate main arms.

12. The carrying device according to claim 10, wherein the first operating plane in which the main arm mechanism operates is a horizontal plane, and the second operating plane in which the auxiliary arm mechanism operates is a vertical plane.